Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

---

1. (original) An aqueous organic fuel-feed fuel cell, comprising:

a first electrode having a first polarity;

a second electrode having a second polarity different than the first polarity;

an electrolyte, comprising a proton-conducting membrane which is coupled to both said first and second electrodes; and

a circulating system, operating to circulate a first liquid organic fuel which is substantially free of acid-containing electrolytes into an area of said first electrode to cause a potential difference between said first and second electrodes when a second component is in an area of said second electrode.

2. (original) A fuel cell as in claim 1, wherein said circulating system includes a first pump, pumping the organic fuel, wherein said second component is oxygen-containing gas.

3. (original) A fuel cell as in claim 1, wherein said proton-conducting membrane is formed of a solid polymer material.

4. (original) A fuel cell as in claim 3, wherein said membrane includes a co-polymer of tetraflouroethylene and perflourovinylether sulfonic acid.

5. (original) A fuel cell as in claim 1, wherein said organic fuel is a combination consisting essentially of an aqueous methanol derivative.

6. (original) A fuel cell as in claim 1, wherein said first electrode is formed of a porous material configured in a way to be wet by the organic fuel.

7. (original) A fuel cell as in claim 6, wherein said first electrode includes an additive which increases wetting properties by decreasing interfacial tension of an interface between the liquid organic fuel and a catalyst on the first electrode.

8. (original) A fuel cell as in claim 7, wherein said additive is formed of substantially the same material which forms said membrane.

9. (original) A method of operating a fuel cell, comprising:

preparing a first electrode to operate as a first polarity electrode, said first electrode having a first surface exposed to the fuel;

circulating an organic fuel which is substantially free of any acid electrolyte into contact with said first surface of said first electrode, said organic fuel having a component which is capable of electro-oxidation;

preparing a second electrode which operates as a second polarity electrode, said second polarity being different than the first polarity, said second electrode having a second surface;

preparing an electrolyte which includes a proton conducting membrane;

circulating a second reactive component into contact with said second surface of said second electrode, said second reactive component including a component capable of electro-reduction; and

coupling an electrical load between said first electrode and said second electrode, to receive a flow of electrons caused by a potential difference between said first and second electrodes.

10. (original) A method as in claim 9, wherein said organic fuel includes a methanol derivative and water and is substantially free of any acid component.

11. (original) A method as in claim 10, wherein said second reactive component is an oxygen-containing gas.

12. (original) A method as in claim 11 further comprising operating said fuel cell to transport protons from the first electrode through the electrolyte to the second electrode, and to form a flow of electrons through the load.

13. (original) An organic fuel cell, comprising:

a first chamber, formed of a plurality of inner surfaces made of a material which is not acid resistant, and including a first port, positioned and sized to receive a fuel therein, and a second port sized to exhaust said fuel therefrom;

a first electrode, including an electrocatalyst operatively coupled thereto, in contact with said first chamber;

an electrolyte, ionically coupled with said first electrode;

a second chamber, having surfaces formed to receive a second component therein which is capable of undergoing reduction;

a second electrode ionically coupled with said electrolyte and having a second surface exposed to said second chamber; and

a fuel circulating mechanism, operating to pump said organic fuel into said first chamber and to receive exhausted fuel therefrom, said fuel circulating mechanism having surfaces which contact said fuel which surfaces are not acid resistant.

14. (original) A fuel cell as in claim 13, wherein said electrolyte includes a proton-conducting membrane.

15. (original) A fuel cell as in claim 13, further comprising an organic fuel, located in said first chamber, said organic fuel substantially free of any acidic or alkaline component.

16. (original) A fuel cell as in claim 15, wherein said second component includes oxygen-containing gas.

17. (original) A fuel cell as in claim 13, wherein said anode includes an electrocatalyst operatively associated therewith.

18. (original) A fuel cell as in claim 17, wherein said electrocatalyst is a metal alloy particle, said metal alloy including platinum.

19. (currently amended) A method of operating an organic fuel cell, comprising:

circulating a mixture of a methanol derivative having the formula RCH_3OH ~~(R-CH_3OH)~~ and water which substantially excludes any acid components into contact with a first electrode;

carrying out an electro-chemical oxidation reaction at the electrode of

$$R\text{-}CH_3OH + H_2O \rightarrow CO_2 + H^+ + e^-;$$

simultaneously with the electro-chemical oxidation reaction, carrying out a second electro-chemical reduction reaction to reduce oxygen and capture electrons at a cathode according to

$$\text{Cathode: } O_2 + 4H^+ + 4e^- \rightarrow H_20\text{; and}$$

attaching a load between said anode and said cathode to receive electron flow from the reaction.

20. (original) A method as in claim 19, further comprising coating the anode with an electrocatalyst to facilitate the reaction.

21. (original) A method as in claim 19, further comprising pressurizing air past the cathode at pressures between 10 and 30 psig.

22. (original) A fuel cell apparatus, comprising:

a first chamber having surfaces for containing an organic aqueous fuel therein;

an anode structure, having a first surface in contact with said first chamber, said anode structure being porous and capable of wetting the liquid fuel and also having electronic and ionic conductivity;

an electrolyte, in contact with said anode structure, said electrolyte formed of a proton-conducting membrane;

a cathode, in contact with said electrolyte in a way to receive protons which are produced by said anode structure, conducted through said electrolyte to said cathode; and

a second chamber, holding said cathode, said second chamber including a second material including a reducible component therein wherein said anode is formed of carbon paper with an electrocatalyst thereon and wherein said fuel is an aqueous solution of a methanol derivative, and said second material is an oxygen-containing gas.

23. (original) A fuel cell as in claim 5, wherein said methanol derivative is dimethoxymethane mixed with water to a concentration of about .1 to 2 M.

24. (original) A fuel cell as in claim 5, wherein said methanol derivative includes dimethoxymethane forming an electro chemical reaction of

$$(CH_3O)_2CH_2 + 4H_2O \quad CO_2 + 16H^+ + 16e^-.$$

25. (original) A fuel cell as in claim 5, wherein said methanol derivative is trimethoxymethane mixed with water to a concentration of about .1 to 2 M.

26. (currently amended) A fuel cell as in claim 5, wherein said methanol derivative includes trimethoxymethane, forming an electro chemical reaction of

$$(CH_3O)_3CH + 5H_2O \rightarrow 4CO_2 + 20H^+ + 20e^-.$$

27. (original) A fuel cell as in claim 5, wherein said methanol substance is trioxane mixed with water to a concentration of about .1 to 2 M.

28. (currently amended) A fuel cell as in claim 5, wherein said methanol derivative includes trioxane, forming an electro chemical reaction of

$$(CH_2O)_3CH_2 + 6H_2O \rightarrow {}_3CO_2 + 12H^+ + 12e^-.$$

29. (original) An aqueous fuel-fed fuel cell, comprising:

anode electrode means for producing electrons when the fuel cell is operating;

cathode electrode means for receiving electrons when the fuel cell is operating;

means for circulating a first aqueous and non-acid organic fuel in an area of one of said electrode means, and circulating an oxygen-containing gas in an area of the other of said electrode means;

an electrolyte, comprising a proton conducting membrane; and

connection means, connected respectively to said anode electrode means and said cathode electrode means, for producing a potential difference therebetween, allowing a flow of electrons between said anode electrode means and said cathode electrode means, through a load.

30. (original) An organic fuel cell, comprising:

a first chamber, formed of a plurality of inner surfaces made of a first material;

a first electrode, including an electrocatalyst thereon, said first electrode being in contact with said first chamber,

an electrolyte, ionically coupled with said anode electrode;

a second electrode ionically coupled with said electrolyte; and

a mechanism operating to pump said fuel into said first chamber and to receive exhausted fuel therefrom, said mechanism having surfaces which contact said fuel;

wherein at least one of the surfaces which contacts said organic fuel is formed of a material which is not acid resistant.

31. (original) A method of oxidizing aqueous methanol in a fuel cell reaction, comprising:

receiving aqueous methanol at an anode;

oxidizing said aqueous methanol at the anode;

producing protons from the aqueous methanol oxidizing at the anode;

allowing the protons to cross a proton conducting membrane to a cathode and reducing a second component, at the cathode, using said protons which are produced at said anode wherein said aqueous methanol is substantially free of an acid component, said protons being produced from said oxidizing reaction.

32. (original) A method of operating a fuel cell, comprising:

preparing a first electrode to operate as a first polarity electrode, said first electrode having a first surface exposed to the fuel;

modifying said first electrode in a way to bring the fuel into better contact with the first electrode by its wetting of the first electrode;

circulating an organic fuel which is substantially free of any acid electrolyte into contact with said first surface of said first electrode, said organic fuel having a component which is capable of electro-oxidation;

preparing a second electrode which operates as a second polarity electrode, said second polarity being different than the first polarity, said second electrode having a second surface;

preparing an electrolyte which includes a proton conducting membrane;

circulating a second reactive component into contact with said second surface of said second electrode, said second reactive component including a component capable of electro-reduction to form a reaction.

33. (original) Method as in claim 32 wherein said wetting comprises treating the anode electrode with a proton conducting agent.

34. (currently amended) A method of operating an organic fuel cell, comprising:

circulating a mixture of a methanol derivative having the formula RCH_3OH ~~($R-CH_3OH$)~~ and water into contact with a first electrode;

carrying out an electro-chemical oxidation reaction at the first electrode of

$$R\text{-}CH_3OH + H_2O \rightarrow CO_2 + H^+ + e^-$$

to thereby create protons from the electro-chemical oxidation reaction;

allowing said protons created at the first electrode to pass through a proton conducting membrane to a second electrode;

substantially simultaneously with the electro-chemical oxidation reaction, carrying out a second electro-chemical reduction reaction to reduce oxygen and capture electrons at the second electrode, using the protons created at the first electrode, according to

$$\text{Cathode: } O_2 + 4H^+ + 4e^- \rightarrow H_2O;$$

to thereby form a potential difference between said first and second electrodes.